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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,219	11/16/2001	Manabu Kitamura	16869S-038000US	3936

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EXAMINER

LIEN, TAN

ART UNIT PAPER NUMBER

2141

DATE MAILED: 05/03/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/991,219

Applicant(s)

KITAMURA ET AL.

[Signature]

Examiner

Tan Lien

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/16/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>Z-8</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTIONS

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The disclosure is objected to because of the following informalities:

On page 7 at line 21, "a one" is used incorrectly. "a" is an extra character in the sentence.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-15 rejected under 35 U.S.C. 102(b) as being anticipated by Ofek et al (US Pat. 5,680,640), hereinafter referred to as Ofek.

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Claim 13: Ofek discloses a storage apparatus's data migrating method in a computer system which comprises host computers, a plurality of storage apparatuses, a unique ID that is unchangeable from outside being assigned to each of said storage apparatuses, and a switch for interconnecting said host computers with said plurality of storage apparatuses, said storage apparatus's data migrating method comprising the steps of:

causing at least one of said plurality of storage apparatuses to disguise a virtual storage apparatus so as to provide said virtual storage apparatus to said host computers (col. 6, lines 18-36; The "background" process or data migration process {col. 6, lines 17-20} copies/"migrate" the data from first data storage to second data storage completely transparent to the host {col. 6, lines 28-32}),

creating a table holding flag (col. 2, lines 28-31 and Ofek's FIG. 2) indicating a data migration state on a fixed-sized data block (LBA) basis (col. 4 and lines 54-59),

prohibiting a response to an access request made from said host computers to said virtual storage apparatus (col. 1, lines 47-50; The data are migrating/copying from first storage device to second storage device without intervention from the host data processing system, therefore the server is not responding to host access request),

modifying dynamically an arbitrary storage apparatus to another arbitrary storage apparatus as at least one of said storage apparatuses caused to disguise said virtual storage apparatus (col. 6, lines 18-36; The data migration process is a software program running in the background modifying dynamically the storage devices {col. 6, lines 17-20} transparently to the host {col. 6, lines 28-32}),

restarting said response to said access request made from said host computers to said virtual storage apparatus (col. 9, lines 21-24),

migrating said data block into said another arbitrary storage apparatus on said fixed-sized data block basis (col. 4 and lines 54-59), said data block being stored into said arbitrary storage apparatus (col. 2, lines 33-35), and

executing, toward said another arbitrary storage apparatus, an access to said data block to be performed in response to said access request made from said host computers (col. 2, lines 39-43).

Claim 14: Ofek discloses the data migrating method as describe in claim 13 above, further comprising the steps of:

writing said fixed-sized data block into a corresponding storage position in said another arbitrary storage apparatus in response to a writing request for said

fixed-sized data block from said host computers, and after that, modifying a migration state of a flag to "data migration completed", said flag corresponding to said written-in data block in said table (col. 2, lines 56-67 to col.3, lines 1-7).

Claim 15: Ofek discloses the data migrating method as describe in claim 13 above, further comprising the steps of:

obtaining, in response reading request for said fixed-sized data block from said host computers, a migration state of a flag by making reference to said table (col. 2, line 44) , said flag corresponding said fixed-sized data block for which said reading request has been made, and, said migration state is "data migration uncompleted" (col. 2, line 49);

migrating, from said arbitrary storage apparatus into said another arbitrary storage apparatus, said data block for which said reading request has been made (col. 2, line 52) ,

modifying said migration state of said flag to "data migration completed" (col. 2, line 55) said flag corresponding in said table to said data block for which said reading request has been made, and after that,

sending said read-out data block to said host computers (col. 2, lines 43-55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US Pat. 5,680,640) as applied to claim 13 above and further in view of Fiacco et al (US Pat. 6,098,125), hereinafter referred to as Fiacco.

Claim(s) 16: Ofek discloses a storage apparatus's data migrating method in a computer system above as describe in claim 13 but fails to disclose a switch for interconnecting the host computers, storage apparatuses, and the back end server. Fiacco, however, teaches the use of a Fiber Channel switch to connect a large number of network devices (col. 2, lines 6-8) including storage devices (col. 2, lines 15-18). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use the Fiber Channel switch instead of the direct fiber optic connections to connect the devices. The motivation is to connect a large number of devices including host computers, storages apparatuses, and a back end server for communication (col. 2, lines 5-8 of Fiacco).

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Claims 1-12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek et al (US Pat. 5,680,640) in view of Fiacco et al (US Pat. 6,098,125).

Claim(s) 1,5,10,12,17,18: Ofek discloses a computer system comprising:

host computers (col. 2, lines 18-25, and reference number 12 of Ofek's FIG. 1);

a plurality of storage apparatuses, a unique ID that is unchangeable from outside being assigned to each of said storage apparatuses (col. 4, lines 13-17, and reference number 14, 16 and 17a-n of FIG. 1 of Ofek; wherein the devices are in a network environment, hence, each device has a unique ID recognized by the other devices);

a back end server connected to said host computers through said switch for managing said plurality of storage apparatuses so as to provide a virtual storage apparatus to said host computers, wherein said back end server dynamically modifies a storage apparatus from an arbitrary storage apparatus of said plurality of storage apparatuses to another storage apparatus thereof, said storage apparatus being caused to disguise said virtual storage apparatus (col. 6, lines 18-36, and reference number 18, 24, and 27 in FIG. 1 of Ofek; The second data storage system includes a back end server managing a data map {FIG. 1, ref. 24 of Ofek}, a cache {FIG. 1, ref. 18 of Ofek} and a migration process {FIG. 1, ref. 27

of Ofek}. The back end server is the virtual storage apparatus that performs a “background” data migration process {col. 6, lines 17-20} transparently to the host {col. 6, lines 28-32}, and therefore disguising activities and storage devices {col. 4, lines 13-17, and reference number 14, 16 and 17a-n of FIG. 1 of Ofek} from the host).

Ofek discloses the use of direct fiber optic connections to connect the devices, but fails to disclose a switch for interconnecting the host computers, storage apparatuses, and the back end server. Fiacco, however, teaches the use of a Fiber Channel switch to connect a large number of network devices (col. 2, lines 6-8) including storage devices (col. 2, lines 15-18). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use the Fiber Channel switch instead of the direct fiber optic connections to connect the devices. The motivation is to connect a large number of devices including host computers, storages apparatuses, and a back end server for communication (col. 2, lines 5-8 of Fiacco).

Claim(s) 2,11: Ofek discloses the computer system as claimed in claim(s) 1 and 10 respectively above,

wherein, while dynamically modifying said storage apparatus caused to disguise said virtual storage apparatus, said back end server makes no response to an access request made from said host computers to said virtual storage apparatus (col. 1, lines 47-50; The data are migrating/copying from first storage device to

second storage device without intervention from the host data processing system, therefore the server is not responding to host access request).

Claim(s) 3: Ofek discloses the computer system as claimed in claim 1 above, further comprising:

a data migration unit for migrating data (col. 6, lines 17-34 and reference number 24 [Migrate process]) in said arbitrary storage apparatus into said another storage apparatus on a fixed-sized block (LBA) basis (col. 4 and lines 54-59), and

a table holding a flag (col. 2, lines 28-31 and Ofek's FIG. 2) for indicating a data migration state on said fixed-sized data block basis, wherein, in response to writing request (col. 2, line 56) for said fixed-sized data block from said back end server, said data migration unit writes said data block into a corresponding storage position in said another storage apparatus, and after that, modifies a migration state of a flag to "data migration completed", said flag corresponding said written-in data block in said table (col. 2, lines 56-67 to col.3, lines 1-7).

Claim(s) 4: Ofek discloses the computer system as claimed in claim 1 above, further comprising:

a data migration unit for migrating data (col. 6, lines 17-34 and reference number 24 [Migrate process]) in said arbitrary storage apparatus into said another

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storage apparatus on a fixed-sized block (LBA) basis (col. 4 and lines 54-59),
and

a table holding a flag (col. 2, lines 28-31 and Ofek's FIG. 2) for indicating a data migration state on said fixed-sized data block basis, wherein, in response to a reading request (col. 2, line 43) for said fixed-sized data block from said back end server, said data migration unit

obtains a migration state of a flag by making reference to said table (col. 2, line 44), said flag corresponding to said data block for which said reading request has been made, and, if said migration state is "data migration uncompleted" (col. 2, line 49)

migrates said corresponding data block from said arbitrary storage apparatus into said another storage apparatus (col. 2, line 52), and

modifies said migration state said flag to "data migration completed" (col. 2, line 55), said flag corresponding said table to said data block for which said reading request has been made, and after that,

passes, to said back end server, said data block for which said reading request has been made (col. 2, lines 43-55).

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Claim(s) 6: Ofek discloses the computer system as describe in claim 1 above,

wherein said another storage apparatus has a data migration unit (col. 6, lines 21-23; The data migration unit is in the second data storage system, which comprises server and a storage apparatus).

Claims 7: Ofek discloses the computer system as describe in claim 1 above,

wherein said back end server has a data migration unit (col. 6, lines 21-23; The data migration unit is in the second data storage system, which comprises a back end server and a storage apparatus).

Claim 8: Ofek discloses a computer system as claimed in claim 1 above,

wherein said back end server and a data migration unit are built in said switch (col. 4, lines 15-22; wherein the second data storage system can act as a switch. The second data storage system is coupled to the first data storage system and the host, therefore, it has multiple ports to interface with the other network devices, and it forwards data frame from one device to the other devices via fiber optic ports).

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Claim 9: Ofek discloses a computer system as claimed in claim 8 above in view of Fiacco,

wherein said switch is a fiber channel (Fiacco's patent, col. 2, lines 15-18).

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Tan Lien whose telephone number is (703) 305-6018. The examiner can normally be reached on Monday-Thursday from 8:30am to 6pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia, can be reached at (703) 305-4003. The fax phone number for this Group is (703) 305-3718.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [tan.lien@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy

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published in the Official Gazette of the Patent and Trademark on February 25, 1997
at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or
proceeding should be directed to the Group receptionist whose telephone number is
(703) 305-3900.


RUPAL DHARIA
SUPERVISORY PATENT EXAMINER